

CLAIMS

1. A polishing pad conditioner for use in a chemical mechanical polishing (CMP) apparatus, comprising:

5 a fixed abrasive polishing pad having an abrasive polishing surface;

a web dressing media having a contact surface defined between a first point and a second point, the first point being separate from the second point, wherein the web dressing media is configured to be positioned over the fixed abrasive polishing pad such that the contact surface of the web dressing media configured to be applied to the
10 abrasive polishing surface of the fixed abrasive polishing pad; and

a pressure application plate configured to be applied against an application surface of the web dressing media that is an opposite surface to the contact surface and is defined between the first position and the second position.

15 2. A polishing pad conditioner for use in a chemical mechanical polishing (CMP) apparatus as recited in claim 1, wherein the surface of the web dressing media dresses the abrasive polishing surface of the fixed abrasive polishing pad by removing an amount of polymer matrix material from the fixed abrasive polishing pad, thereby
20 exposing a fresh surface of fixed abrasive material.

3. A polishing pad conditioner for use in a chemical mechanical polishing (CMP) apparatus as recited in claim 1 further comprising:

a feed-roll positioned above the fixed abrasive polishing pad media, the feed-roll being configured to have a supply of the web dressing media, the feed-roll is positioned at about the first point; and

a take-up roll positioned above the fixed abrasive polishing pad media, the take-up roll being configured to collect at least a linear portion of the web dressing media, the take-up roll is positioned at about the second point.

4. A polishing pad conditioner for use in a chemical mechanical polishing (CMP) apparatus as recited in claim 1, further comprising:

10 a stabilization member for controllably applying the pressure application plate to the opposite surface of the web dressing media, so as to apply the web dressing media to the fixed abrasive polishing pad and cause controlled dressing.

5. A polishing pad conditioner for use in a chemical mechanical polishing (CMP) apparatus as recited in claim 4, wherein the stabilization member includes an application arm.

6. A polishing pad conditioner for use in a chemical mechanical polishing (CMP) apparatus as recited in claim 1, wherein the first point and the second point are configured to precede a wafer application region defined on the abrasive polishing surface of the fixed abrasive polishing pad.

7. A polishing pad conditioner for use in a chemical mechanical polishing (CMP) apparatus as recited in claim 3, wherein the dressing media, the feed-roll and the take-up roll define a web handling system.

8. A polishing pad conditioner for use in a chemical mechanical polishing (CMP) apparatus as recited in claim 7, wherein the web handling system is configured to move in a movement direction between one of a first edge of the fixed abrasive polishing pad and a second edge of the fixed abrasive polishing pad, and move in a movement direction between the second edge of the fixed abrasive polishing pad to the first edge of the fixed abrasive polishing pad.

9. A polishing pad conditioner for use in a chemical mechanical polishing (CMP) apparatus as recited in claim 7, wherein the web handling system further comprises:

a housing to enclose the web handling system.

10. A polishing pad conditioner for use in a chemical mechanical polishing (CMP) apparatus as recited in claim 9, wherein the housing is configured to rotate.

11. A polishing pad conditioner for use in a chemical mechanical polishing (CMP) apparatus as recited in claim 1, wherein the fixed abrasive polishing pad is configured to be one of an orbital pad and a belt-type pad.

12. A method for conditioning a polishing pad, comprising:

providing a fixed abrasive polishing pad having an abrasive polishing surface,
the fixed abrasive polishing pad configured to move between a first point and a second
point, the first point being separate from the second point;

5 providing a web dressing media between the first point and the second point such
that a contact surface of the web dressing media is defined above an abrasive polishing
surface of the fixed abrasive polishing pad; and

applying the contact surface of the web dressing media to the abrasive polishing
surface of the fixed abrasive polishing pad so as to dress the abrasive polishing surface
10 of the fixed abrasive polishing pad.

13. A method for conditioning a polishing pad as recited in claim 12, wherein
the applying the contact surface of the web dressing media to the abrasive polishing
surface of the fixed abrasive polishing pad includes:

15 lowering the contact surface of the web dressing media to the abrasive polishing
surface of the fixed abrasive polishing pad by controllably applying pressure onto the
web dressing media; and

bringing into contact the contact surface of the web dressing media to the
abrasive polishing surface of the fixed abrasive polishing pad.

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14. A method for conditioning a polishing pad as recited in claim 12, wherein the dressing of the abrasive polishing surface of the fixed abrasive polishing pad includes:

removing polymer matrix material from pillars of the abrasive polishing surface of the fixed abrasive polishing pad, the removing being configured to expose a fresh surface of fixed abrasive materials.

15. A method for conditioning a polishing pad as recited in claim 12, wherein the providing a web dressing media between the first point and the second point includes:

providing a feed-roll over the web dressing media, the feed-roll being configured to have a supply of the web dressing media;

providing a take-up roll above the web dressing media, the take-up roll being configured to collect at least a linear portion of the web dressing media; and

feeding the web dressing media from the feed-roll to the take-up roll.

16. A method for conditioning a polishing pad as recited in claim 12, wherein the feeding includes:

indexing the web dressing media at a programmable rate.

17. A method for conditioning a polishing pad as recited in claim 15, further comprising:

dressing the abrasive polishing surface of the fixed abrasive polishing pad by moving across the abrasive polishing surface of the fixed abrasive polishing pad in a movement direction between one of a first edge of the fixed abrasive polishing pad and a second edge of the fixed abrasive polishing pad, and a movement direction between the second edge of the fixed abrasive polishing pad and the first edge of the fixed abrasive polishing pad.

18. A method for conditioning a polishing pad as recited in claim 15, further comprising:

dressing the abrasive polishing surface of the fixed abrasive polishing pad by moving across the abrasive polishing surface of the fixed abrasive polishing pad in a movement direction between one of a center of the fixed abrasive polishing pad and an edge of the fixed abrasive polishing pad, and movement direction between the center of the fixed abrasive polishing pad and the edge of the fixed abrasive polishing pad.

19. A system for conditioning a pad, comprising:

a pad conditioning media;

a feed-roll containing a supply of the pad conditioning media;

a take-up roll for receiving an end of the pad conditioning media; and

a pressure application member defined between the feed-roll and the take-up roll, the pressure application member being designed to apply pressure onto the pad conditioning media as the pad conditioning media is applied against the pad to cause a conditioning of a surface of the pad.

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20. A system for conditioning a pad as recited in claim 19, further comprising:

a housing for containing the pad conditioning media, the feed-roll, the take-up roll, and the pressure application member.

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21. A system for conditioning a pad as recited in claim 19, wherein the pad is one of a fixed abrasive pad, a non-fixed abrasive pad, a belt-type pad, rotary-type, and an orbital pad.

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22. A system for conditioning a pad as recited in claim 19, wherein the pad conditioning media includes an array of abrasive units.

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23. A system for conditioning a pad as recited in claim 22, wherein the units can be one of diamonds, glass tube arrays and ceramics.

add A4

add B2

PATENT APPLICATION